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## Catalytic asymmetric synthesis of acyclic arrays by tandem 1,4-addition-aldol reactions

Howell, Gareth P.; Fletcher, Stephen P.; Geurts, Koen; ter Horst, Bjorn; Feringa, Ben L.

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# Supporting Information

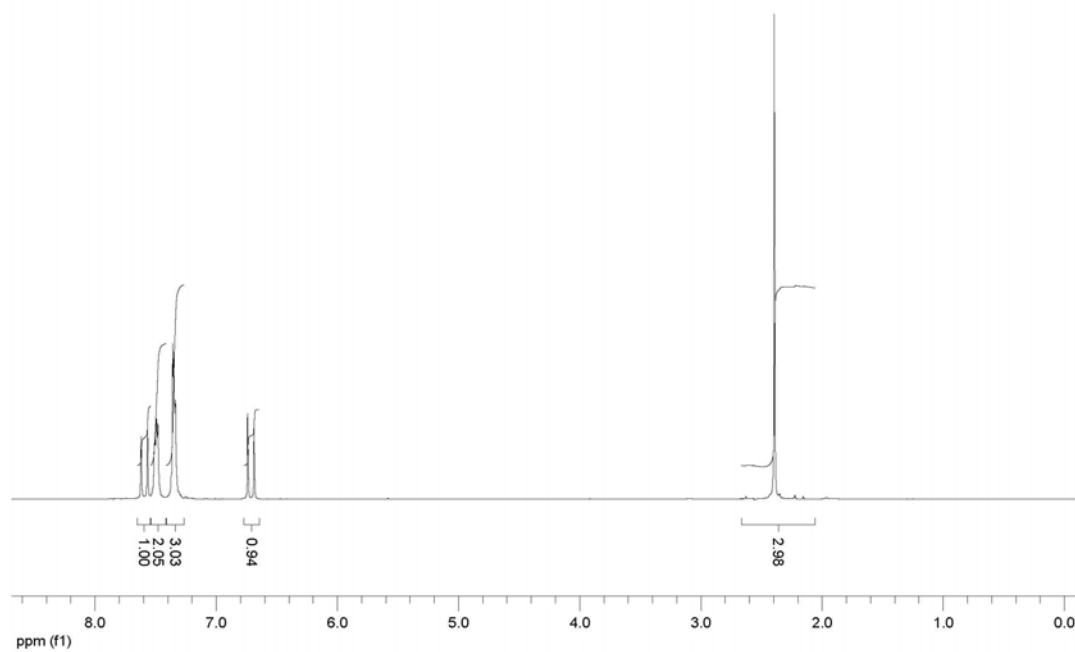
## Catalytic Asymmetric Synthesis of Acyclic Arrays *via* Tandem 1,4-Addition-Aldol Reactions

*Gareth P. Howell, Stephen P. Fletcher, Koen Geurts, Bjorn ter Horst & Ben L. Feringa\**

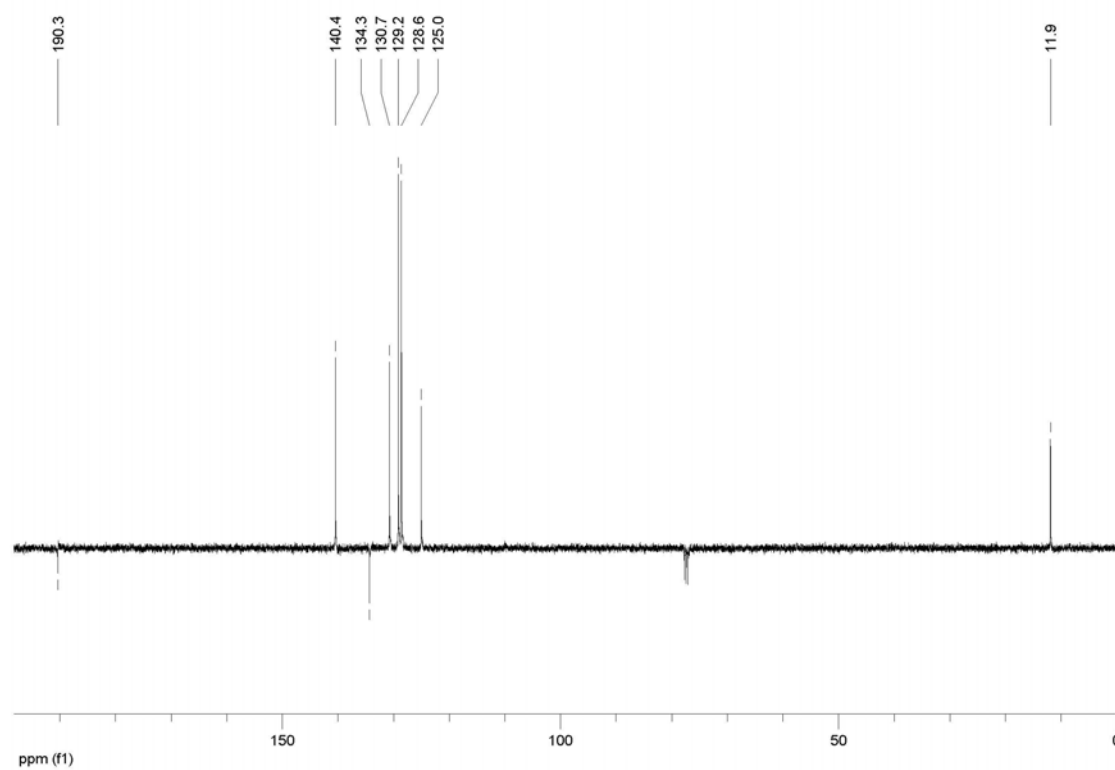
Department of Organic & Molecular Inorganic Chemistry, Stratingh Institute, University of  
Groningen, Nijenborgh 4, 9747 AG, Groningen, The Netherlands

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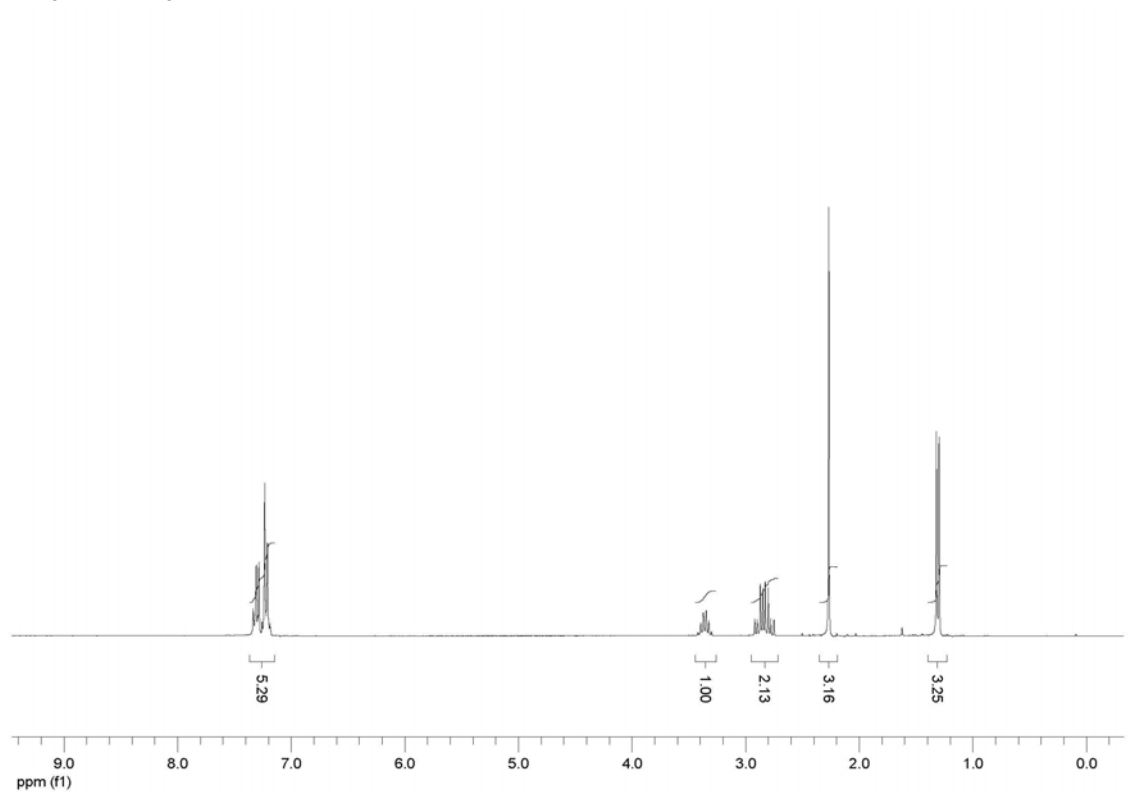
# 8 (<sup>1</sup>H NMR)



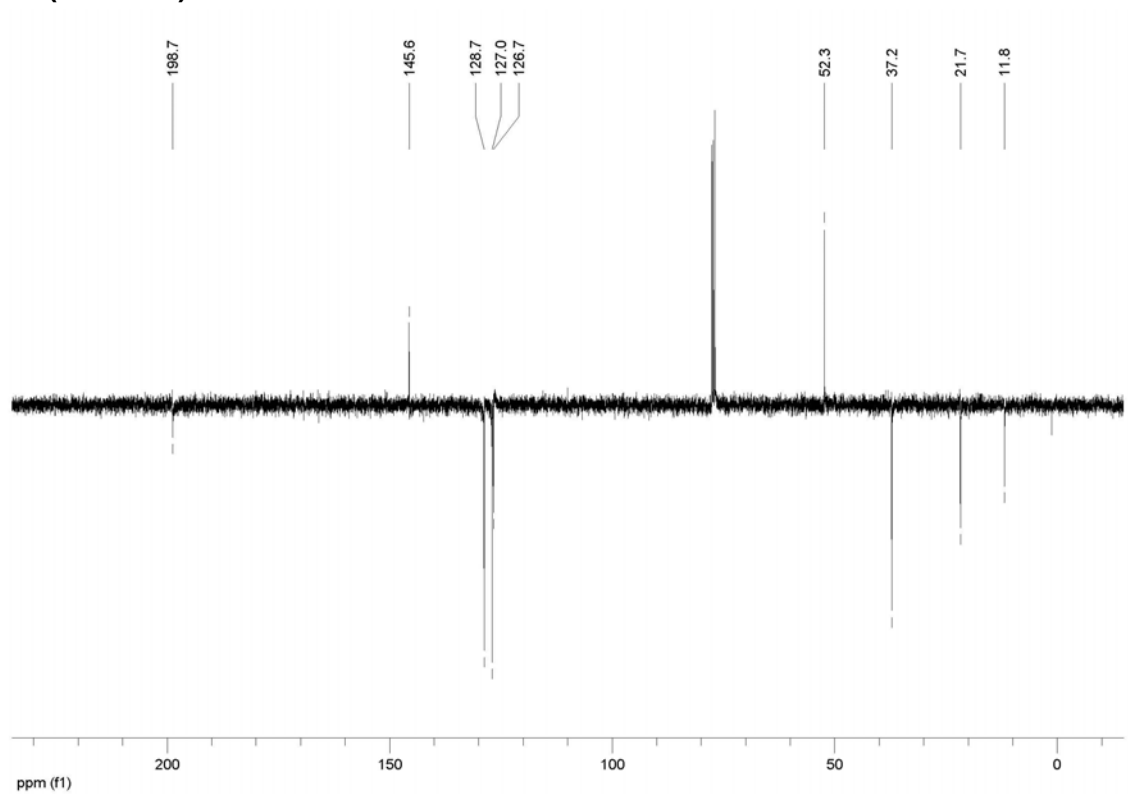
# 8 (<sup>13</sup>C NMR)



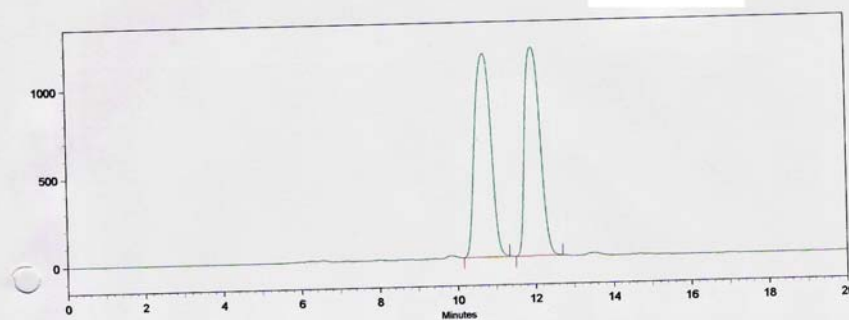
# 10 (<sup>1</sup>H NMR)



# 10 (<sup>13</sup>C NMR)



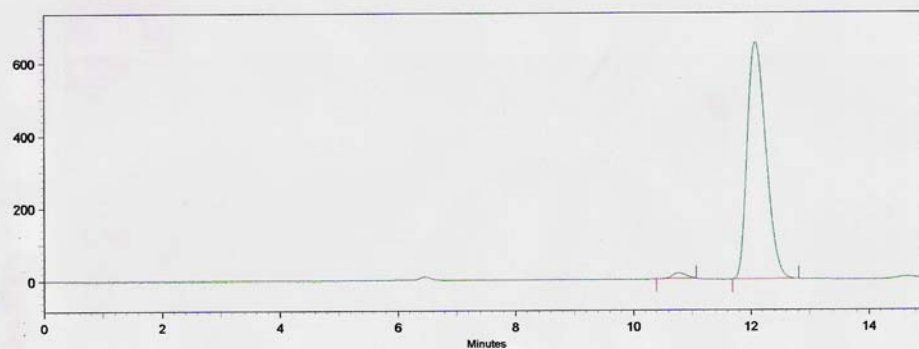
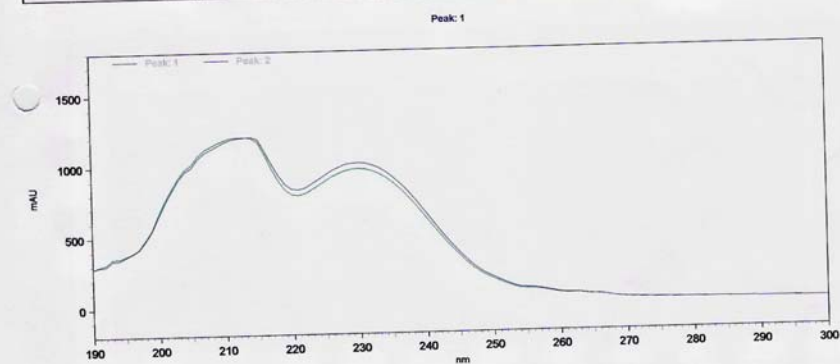
## 10 (HPLC)



3: 210 nm, 8 nm

Pk #	Name	Retention Time	Area	Area Percent
1		10.741	33767518	51.16
2		11.979	32230333	48.84

1				
2				
Totals			65997851	100.00

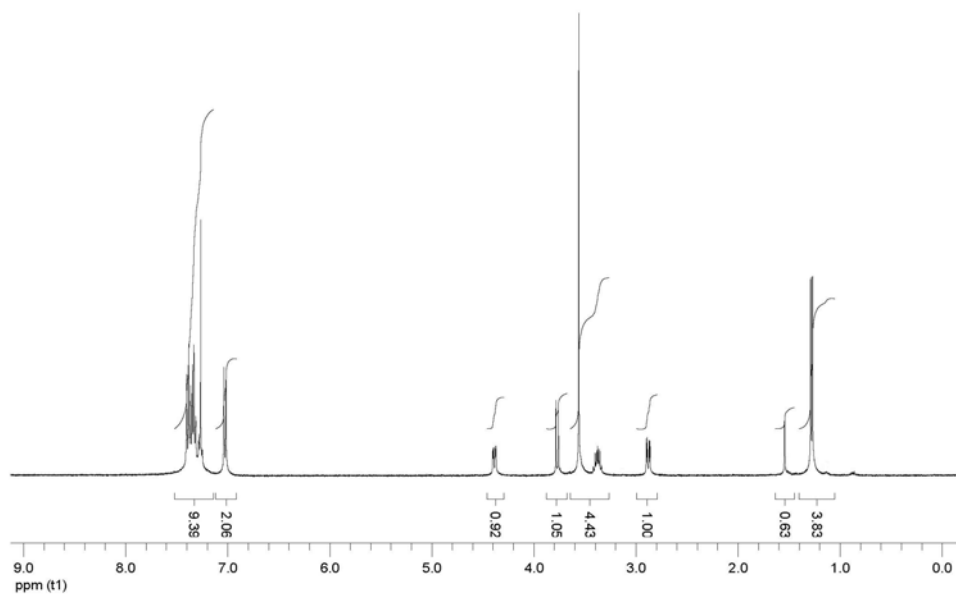


3: 210 nm, 8 nm

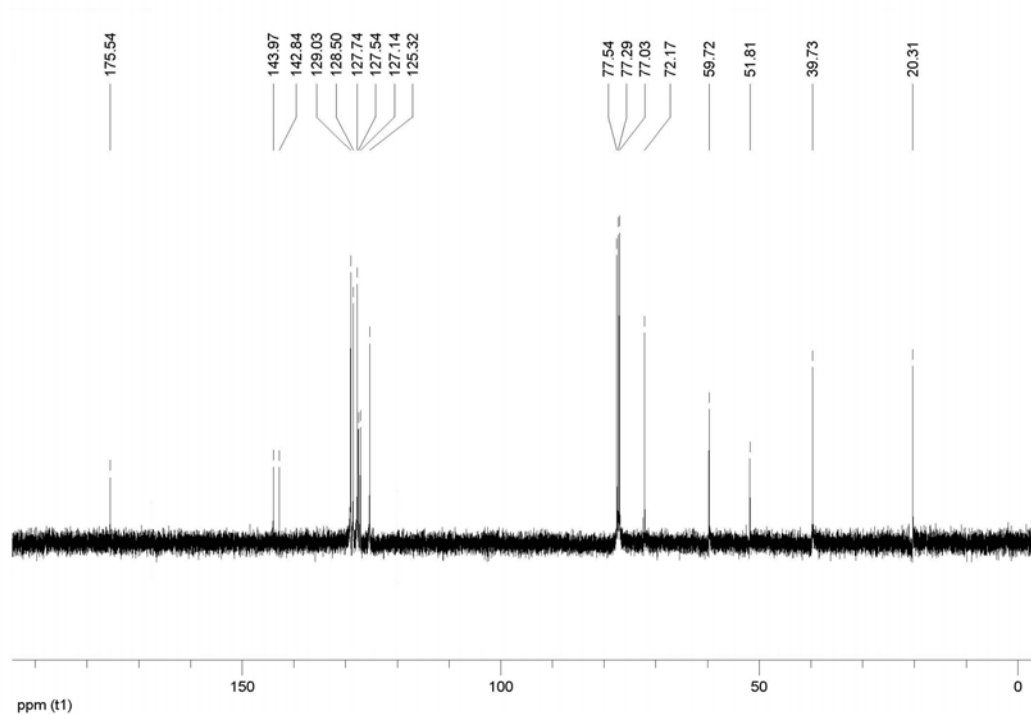
Pk #	Name	Retention Time	Area	Area Percent
1	1	10.763	241186	1.65
2	2	12.075	14394477	98.35

Totals			14635663	100.00
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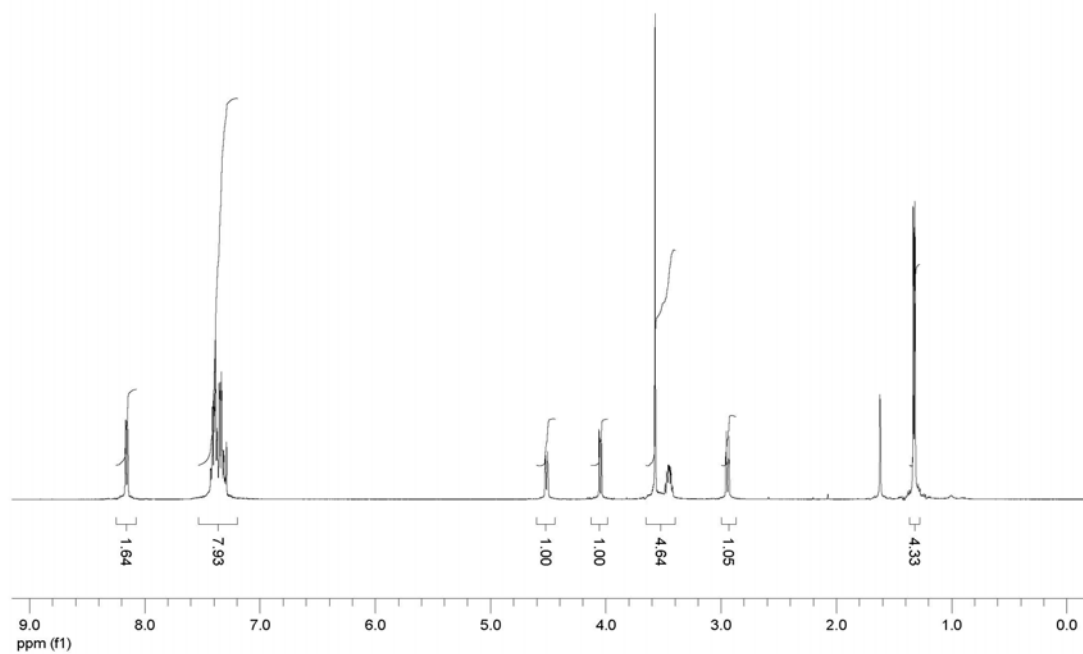
**11a ( $^1\text{H}$  NMR)**



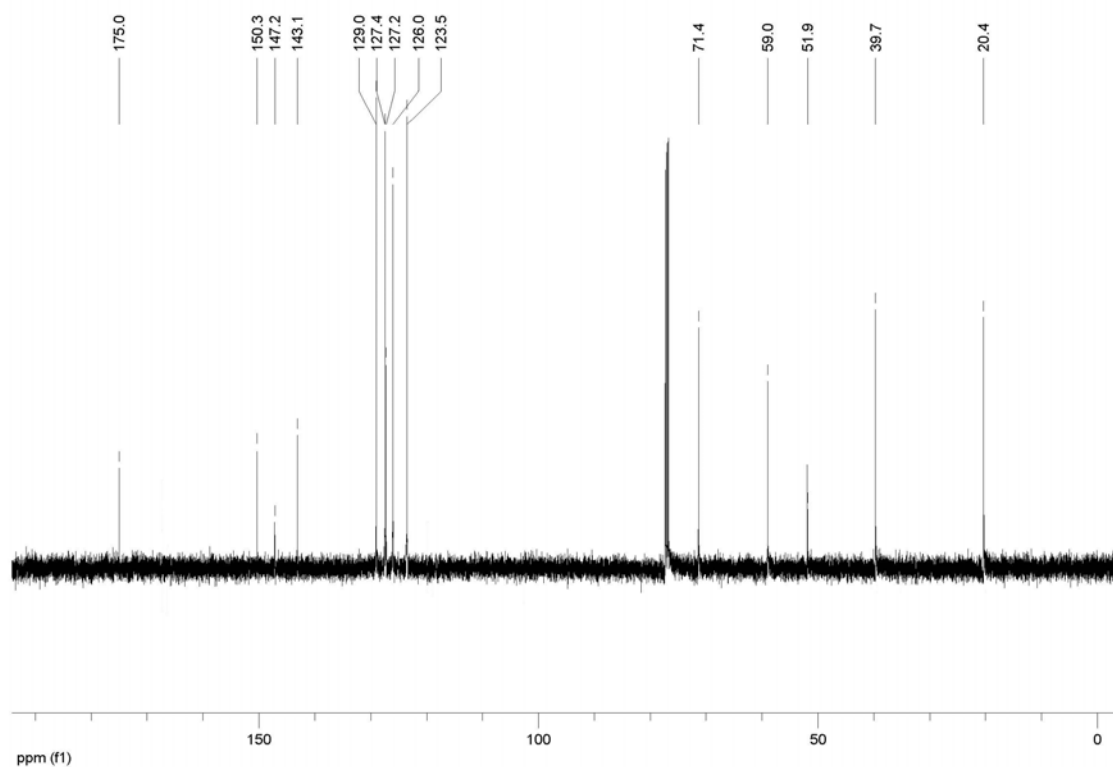
**11a ( $^{13}\text{C}$  NMR)**



# 11b (<sup>1</sup>H NMR)

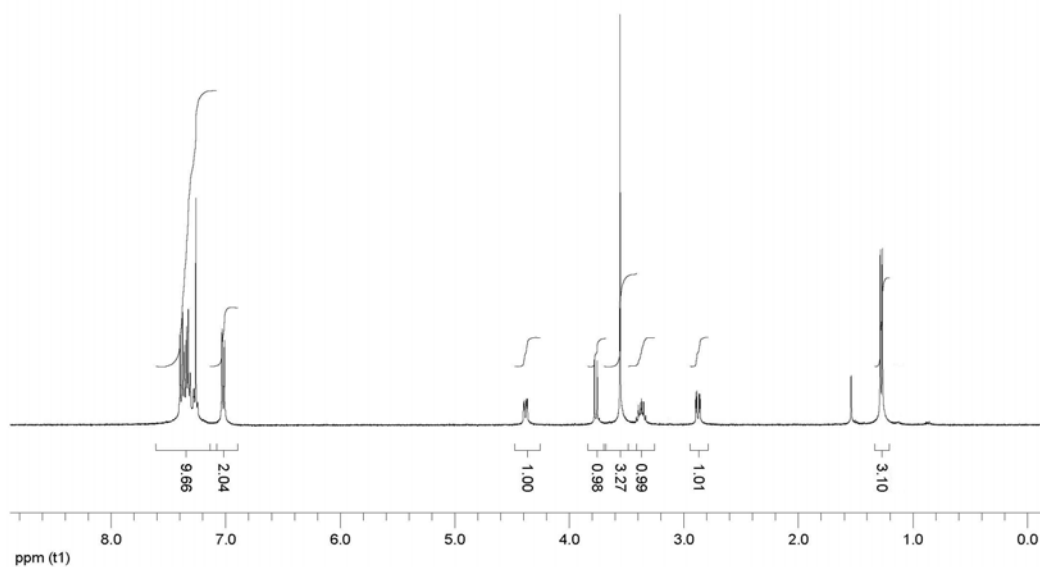


# 11b (<sup>13</sup>C NMR)

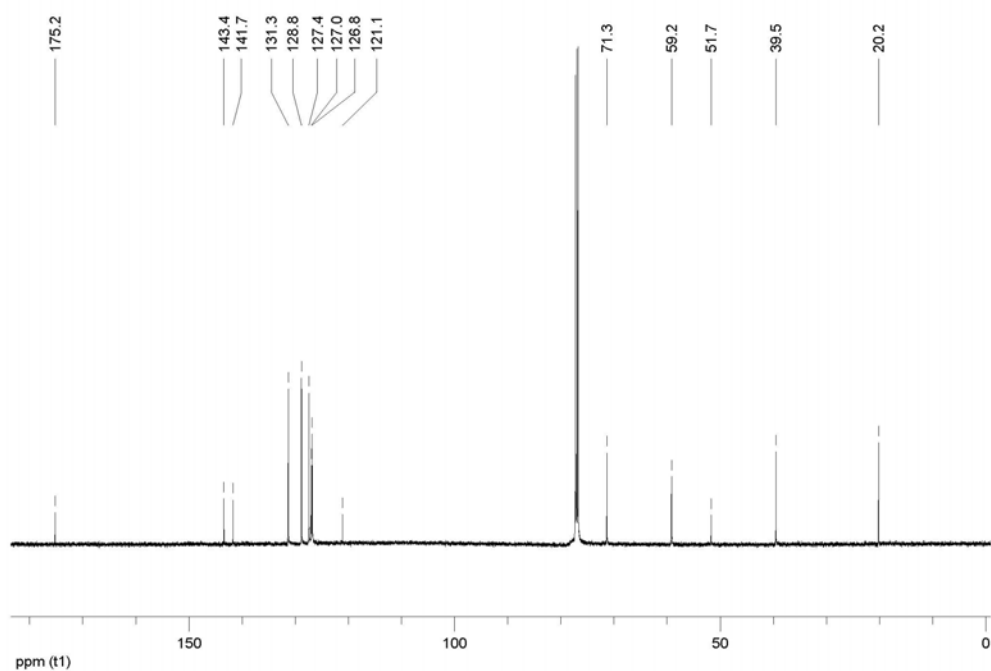




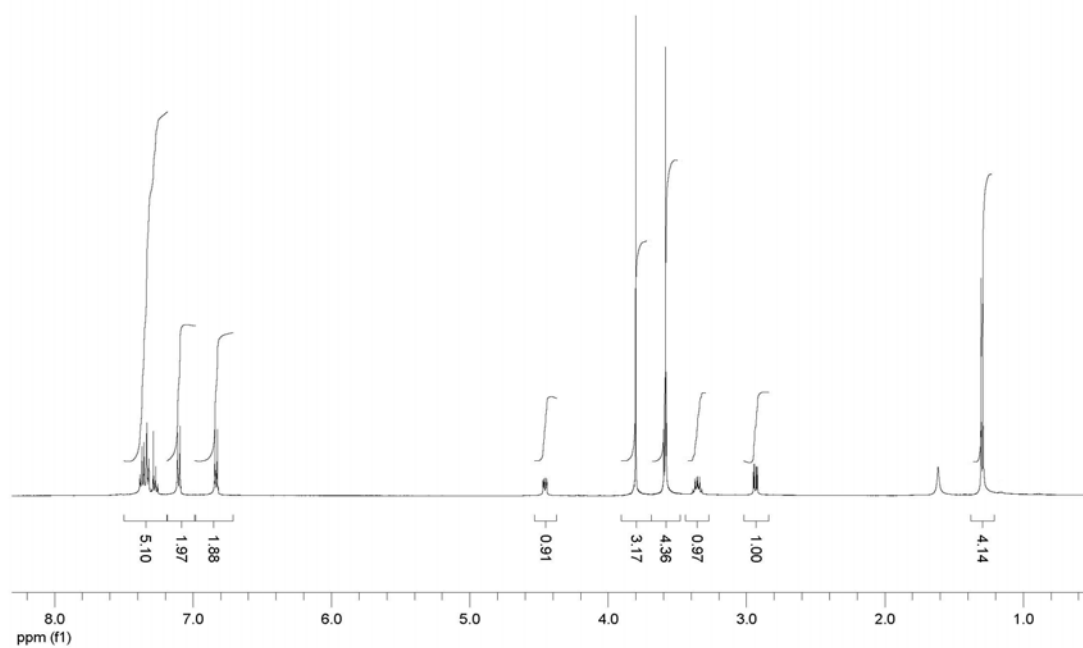
**11c ( $^1\text{H}$  NMR)**



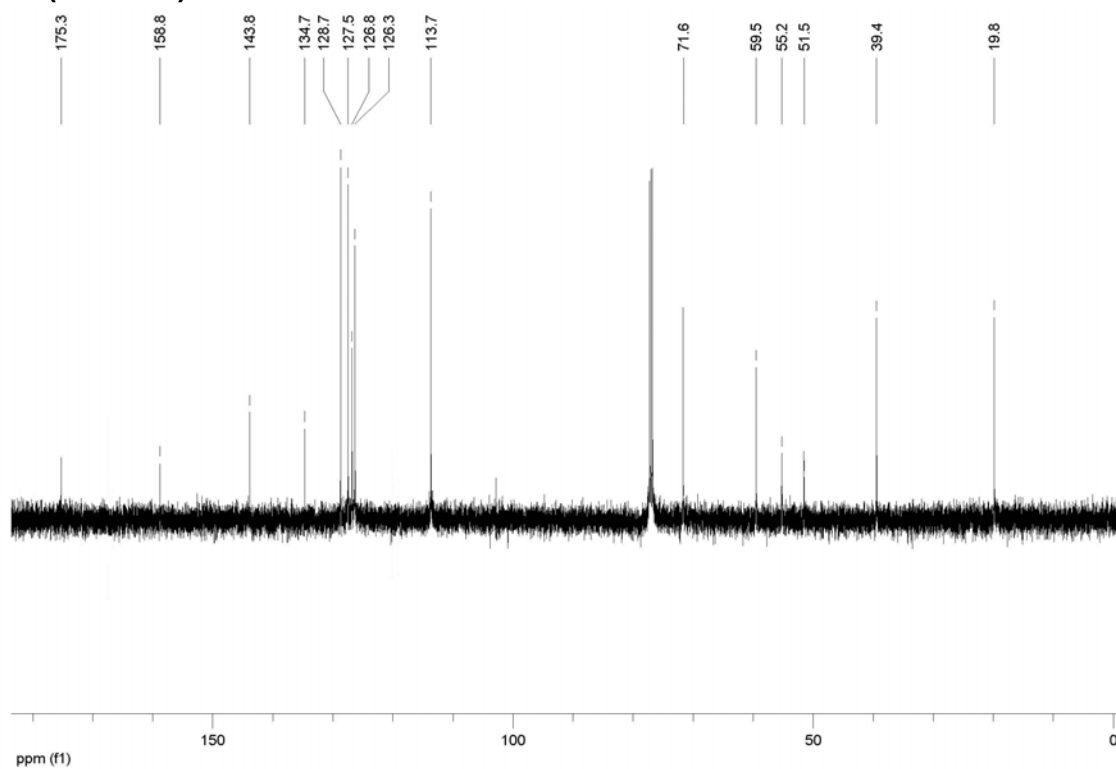
**11c ( $^{13}\text{C}$  NMR)**



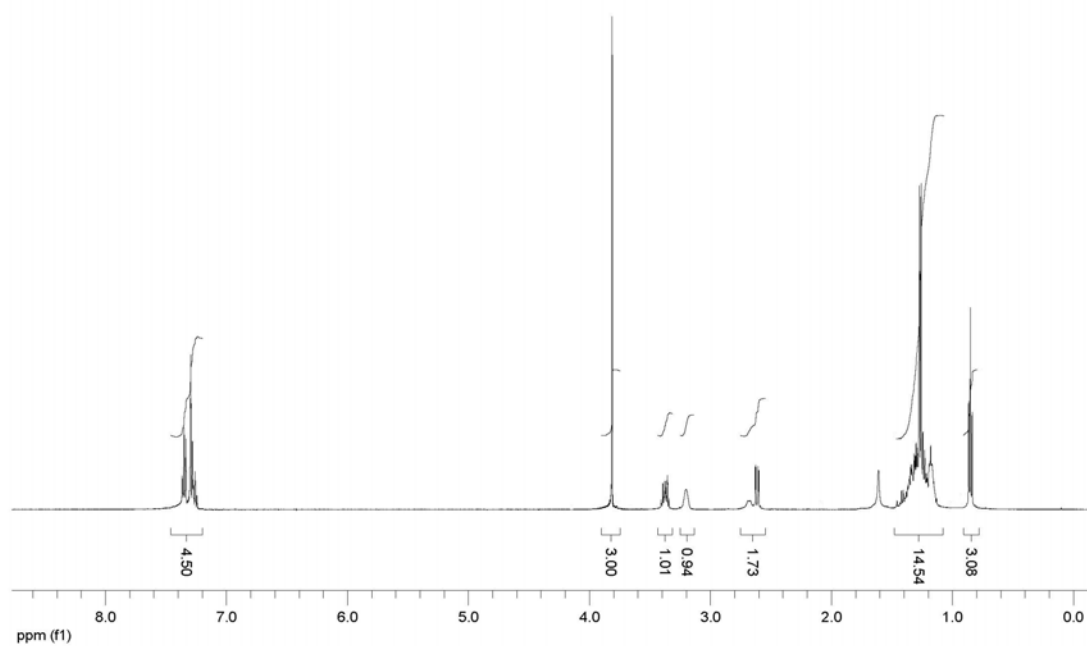
# 11d (<sup>1</sup>H NMR)



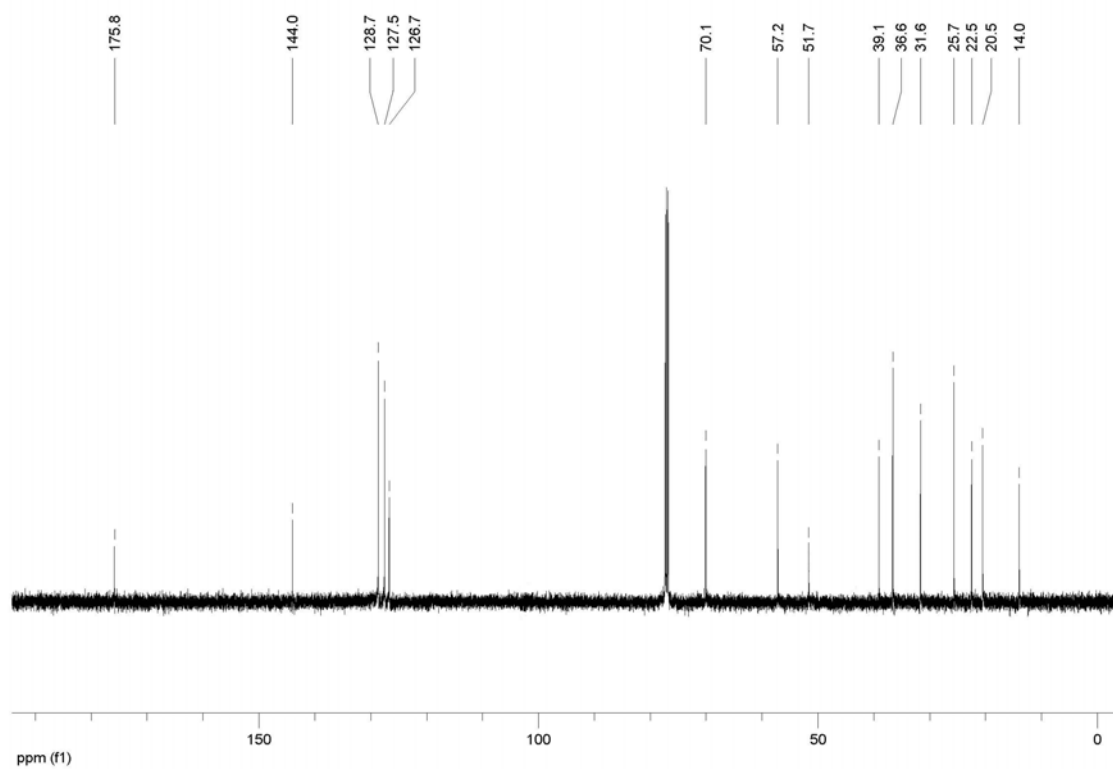
# 11d (<sup>13</sup>C NMR)



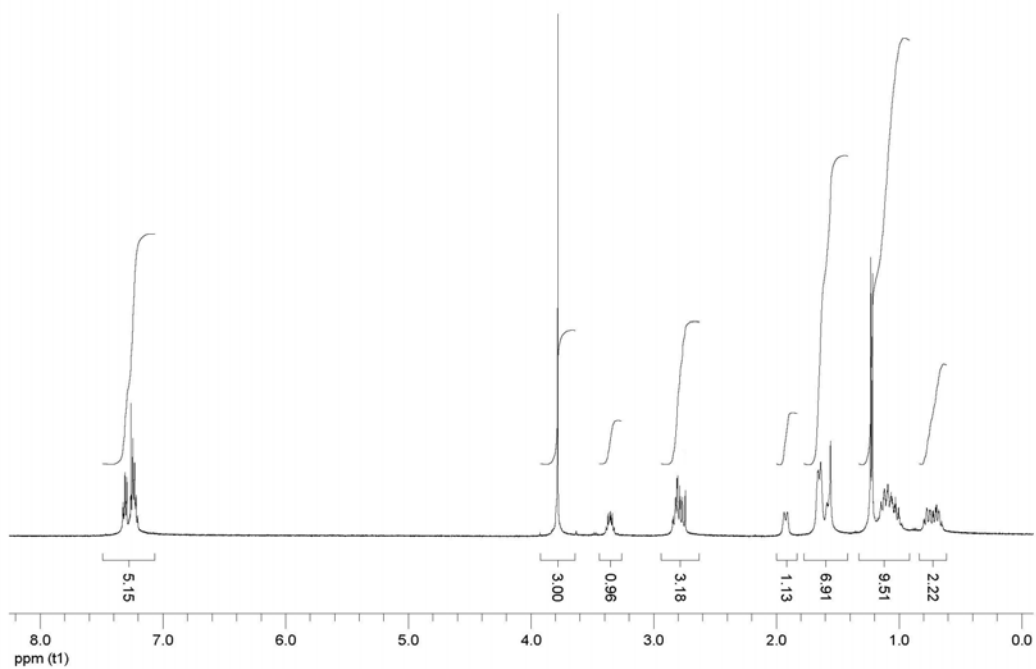
# **11e (<sup>1</sup>H NMR)**



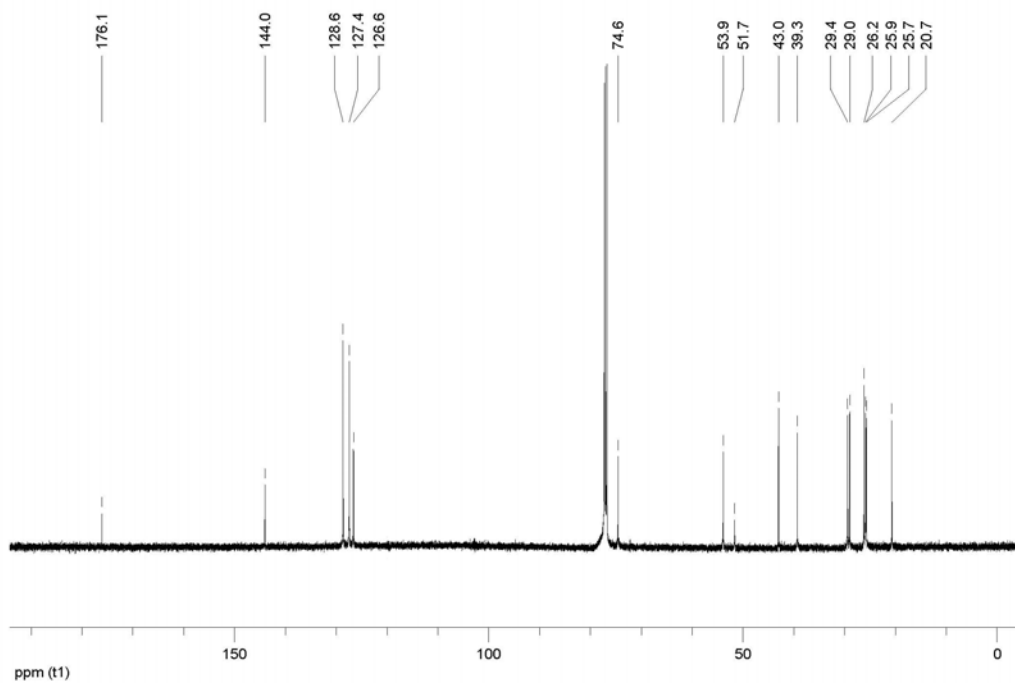
# **11e (<sup>13</sup>C NMR)**



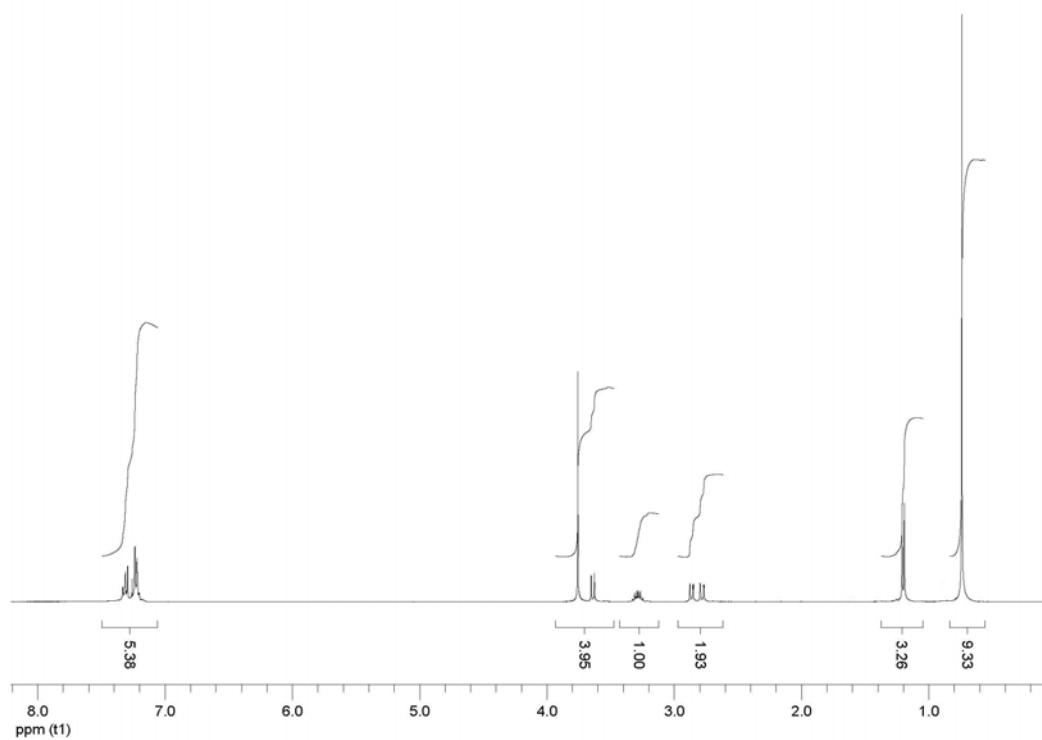
# 11f (<sup>1</sup>H NMR)



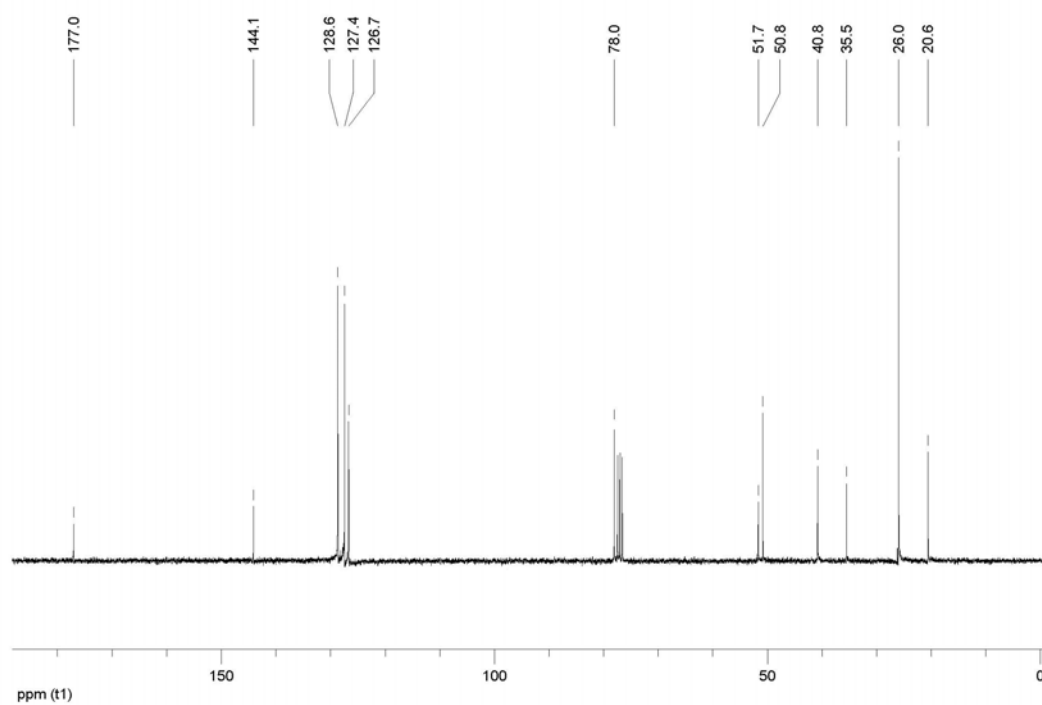
# 11f (<sup>13</sup>C NMR)



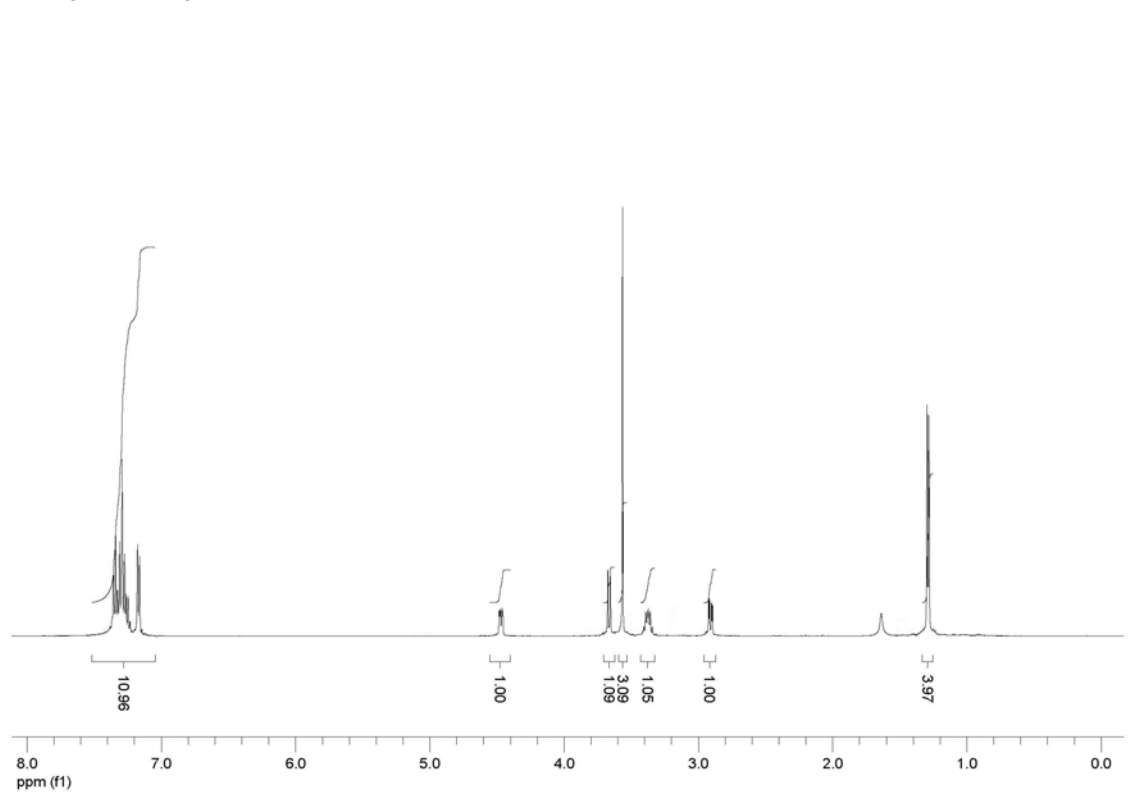
**11g ( $^1\text{H}$  NMR)**



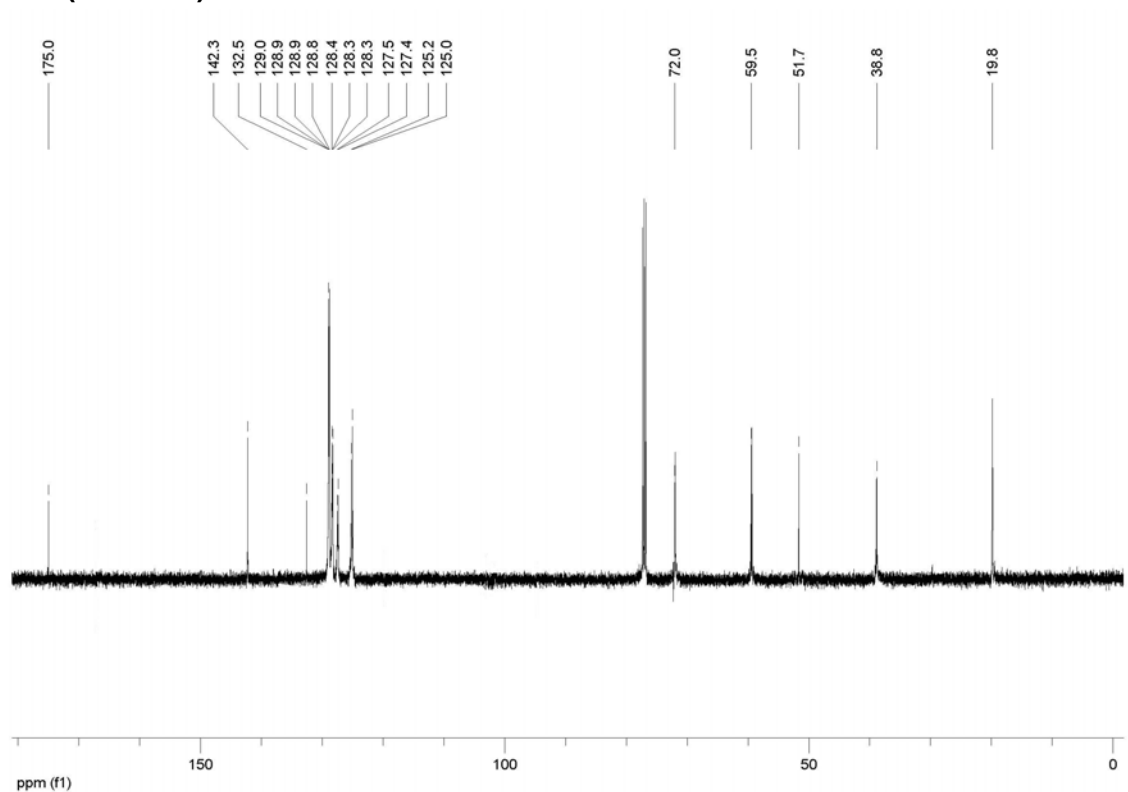
**11g ( $^{13}\text{C}$  NMR)**



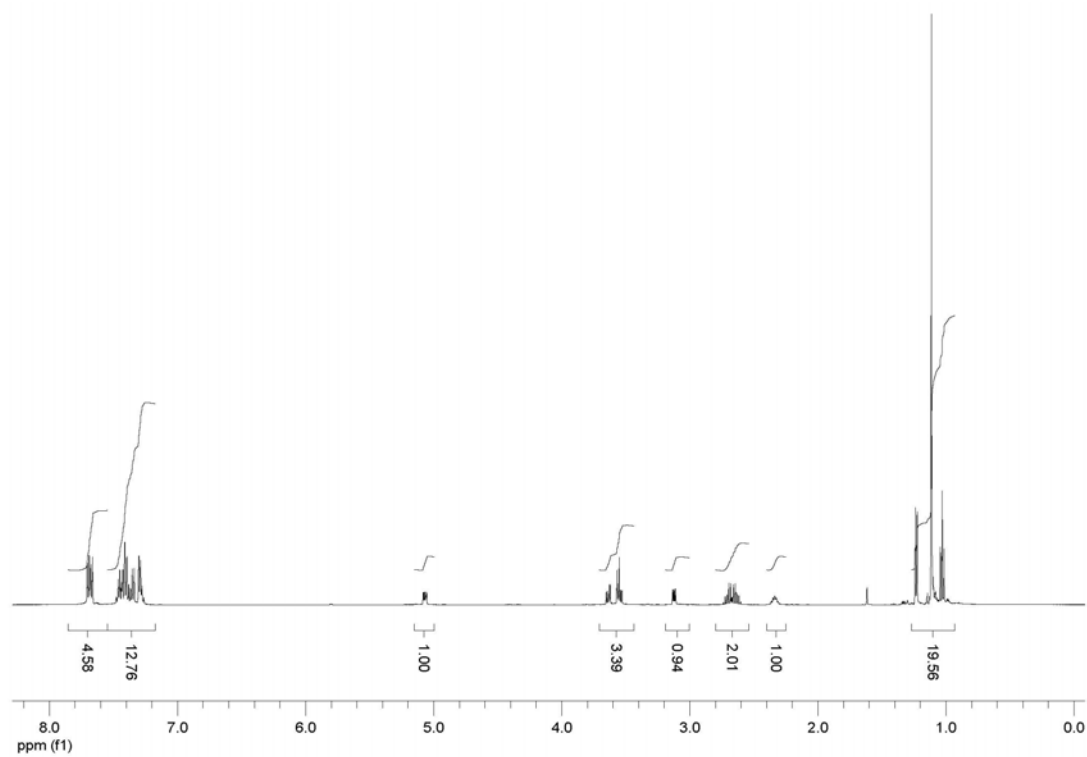
# 11h (<sup>1</sup>H NMR)



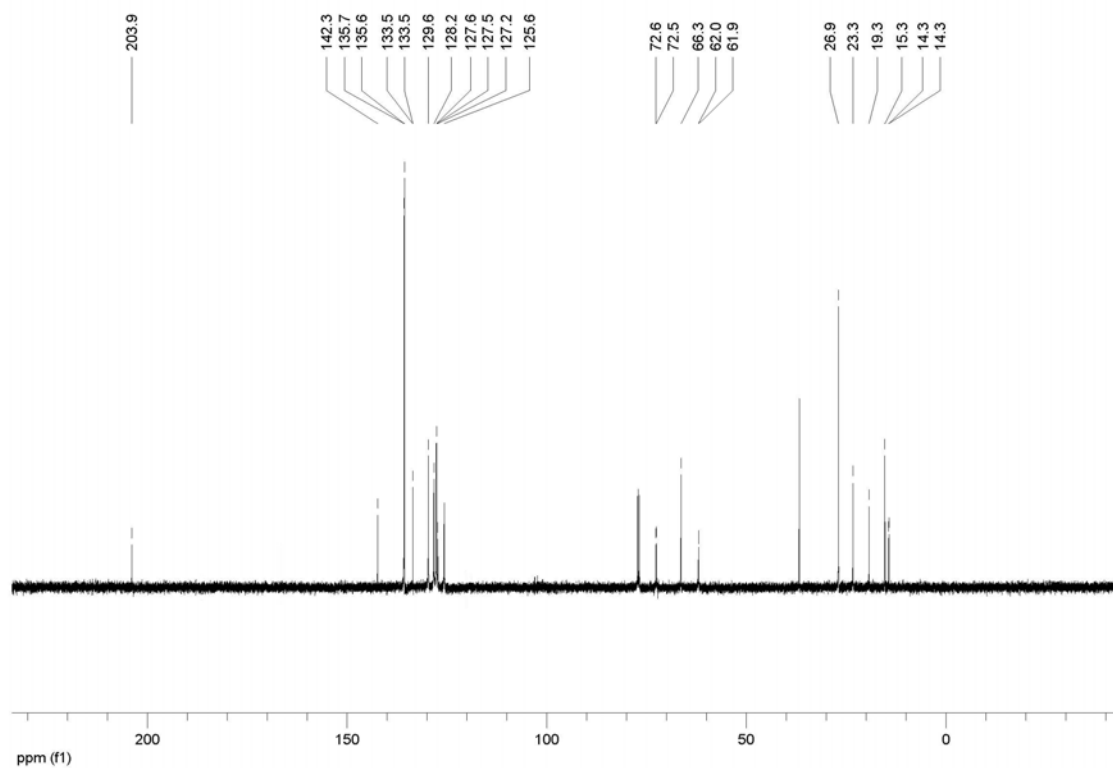
# 11h (<sup>13</sup>C NMR)



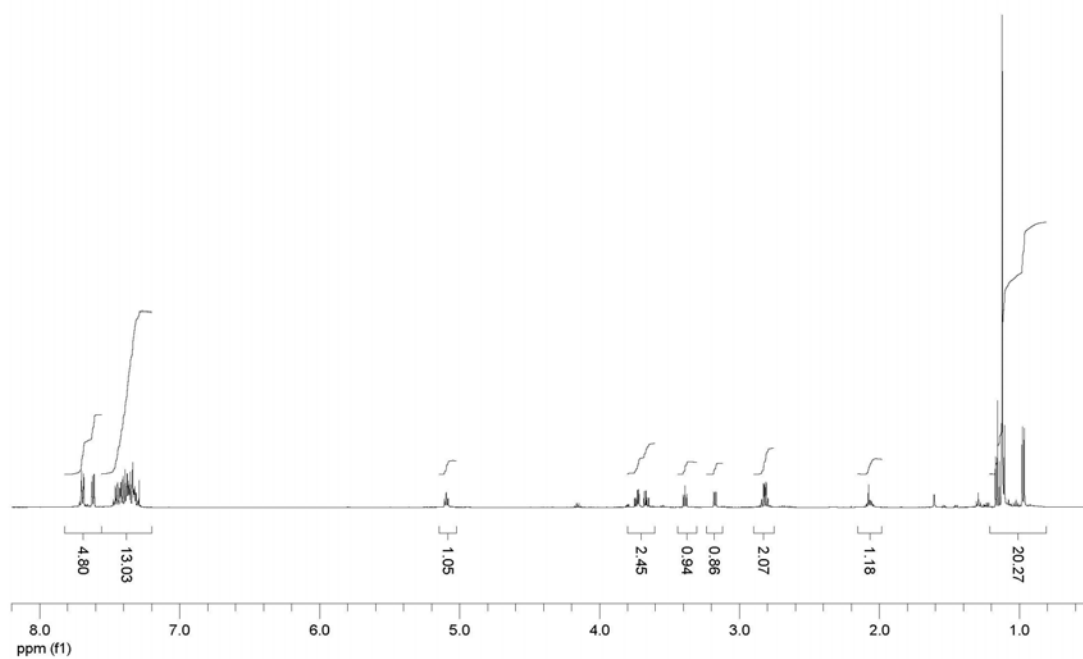
11j first diastereomer ( $^1\text{H}$  NMR)



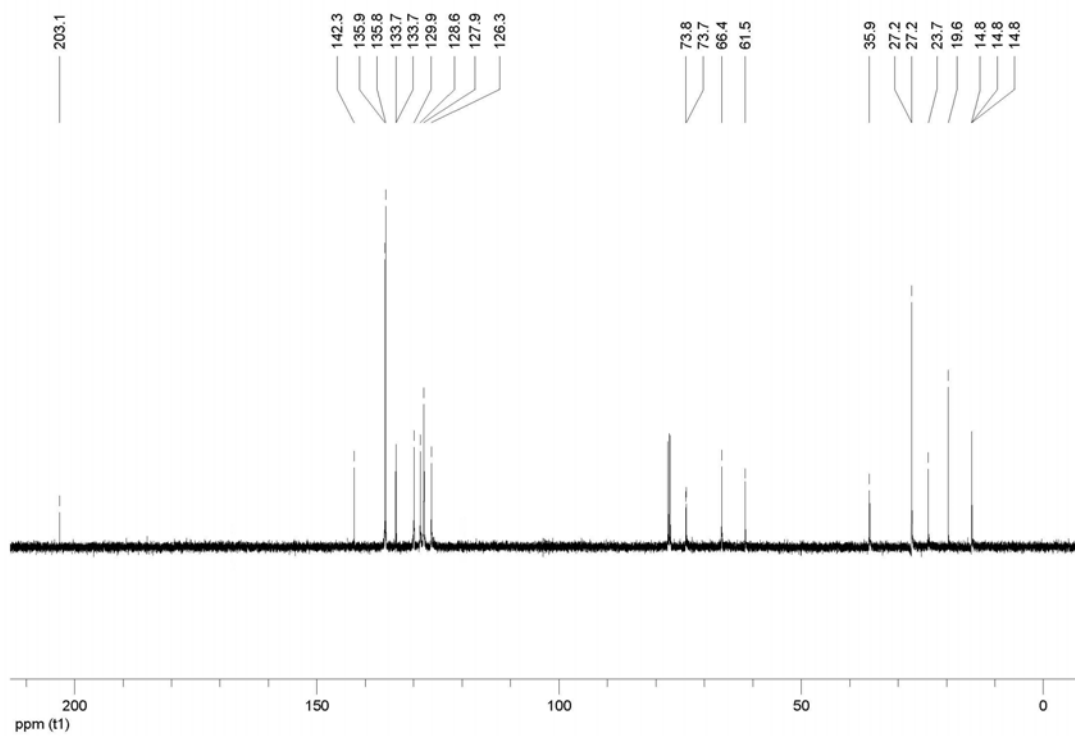
11j first diastereomer ( $^{13}\text{C}$  NMR)



# 11j second diastereomer (<sup>1</sup>H NMR)

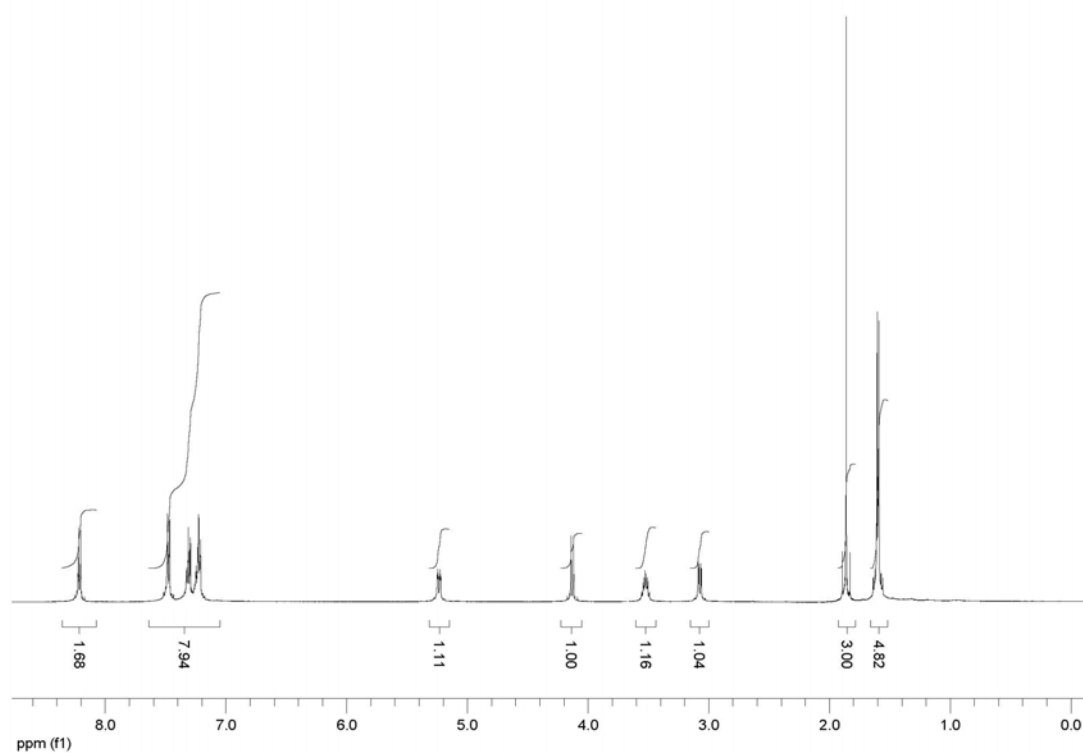


# 11j second diastereomer (<sup>13</sup>C NMR)

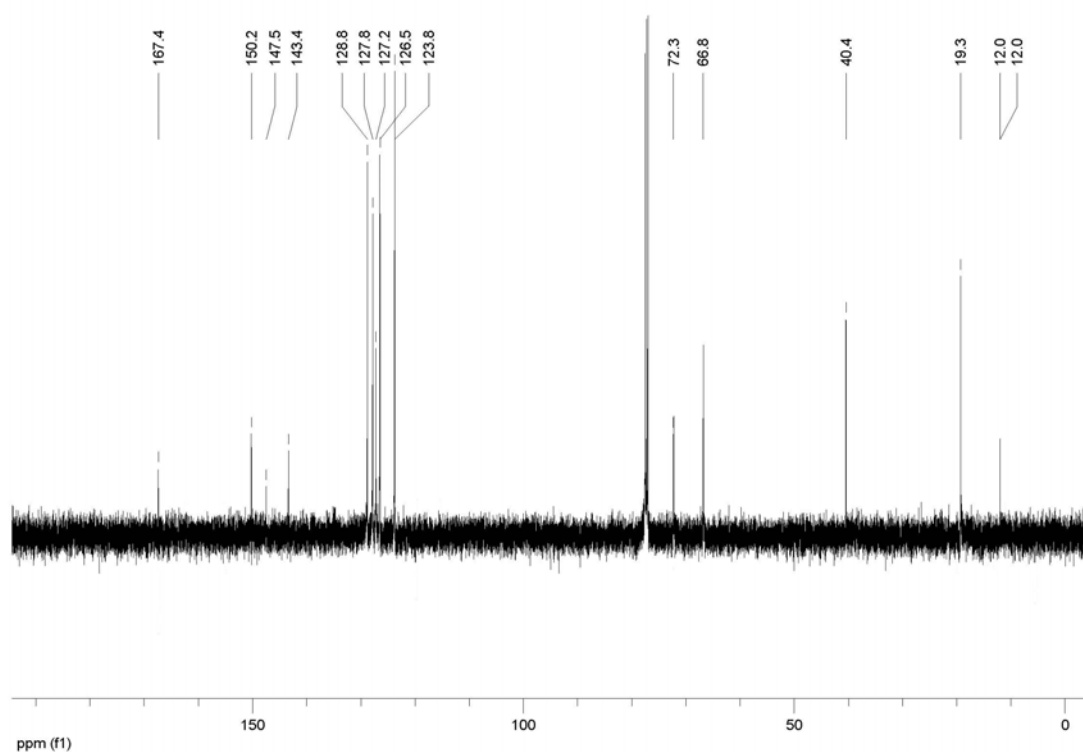




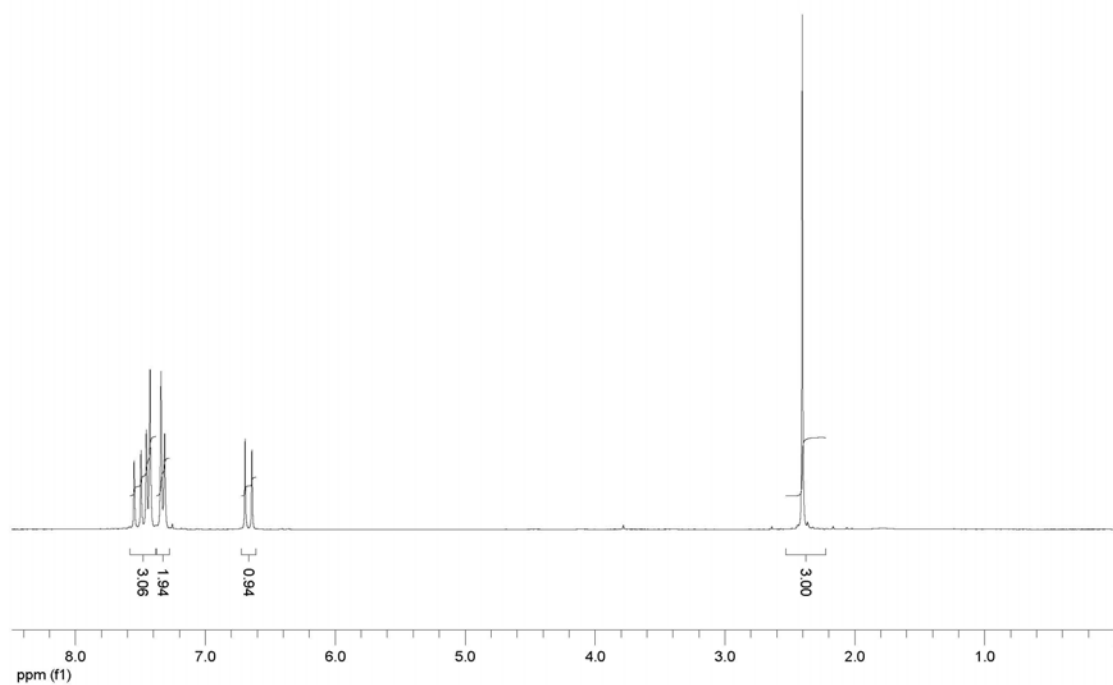
**12b (<sup>1</sup>H NMR)**



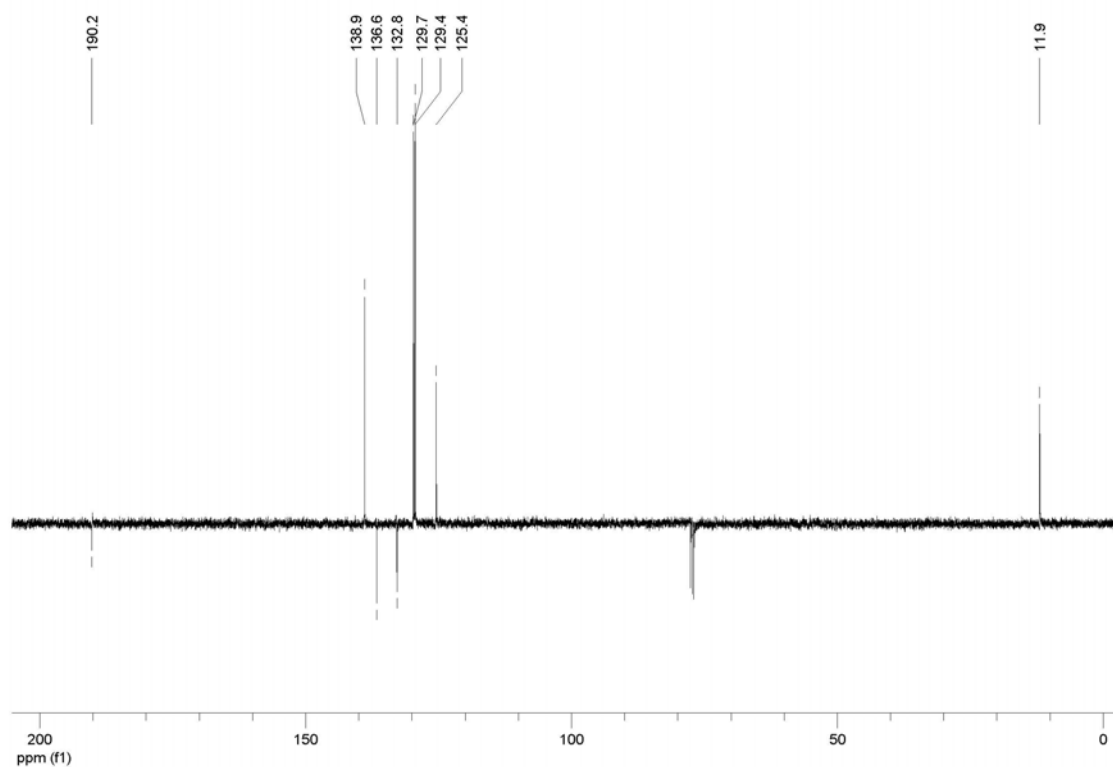
**12b (<sup>13</sup>C NMR)**



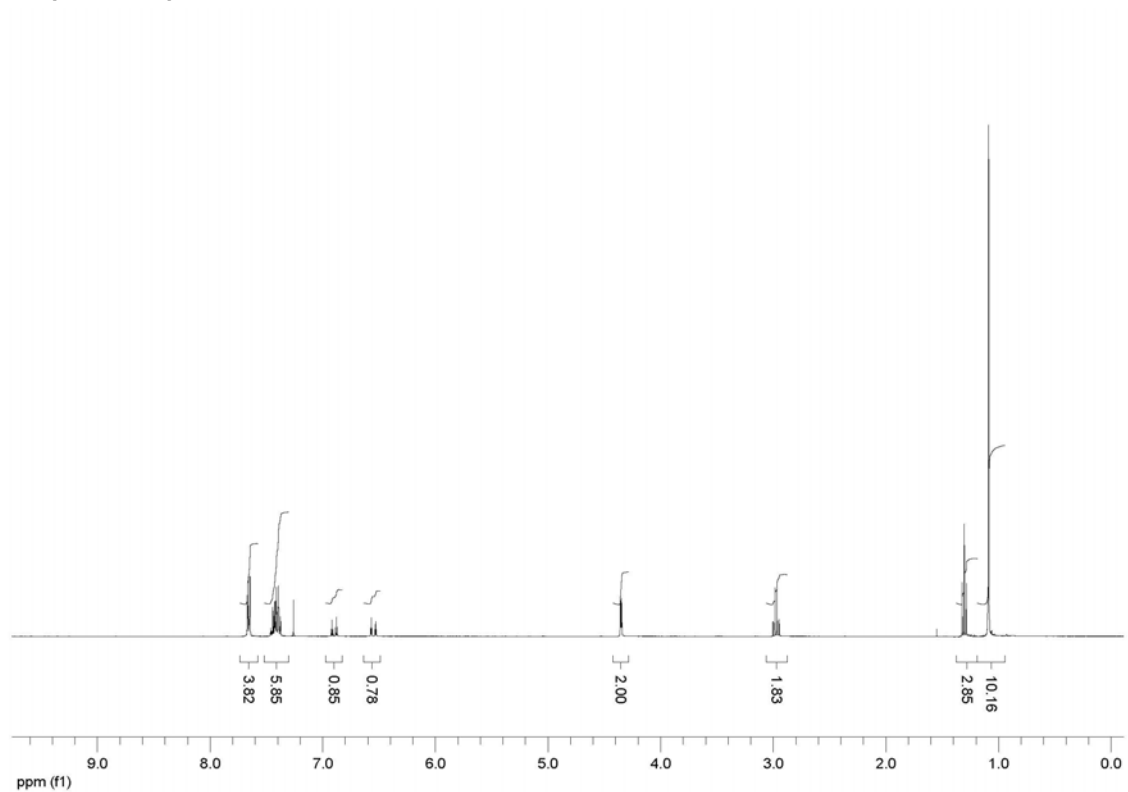
**18 ( $^1\text{H}$  NMR)**



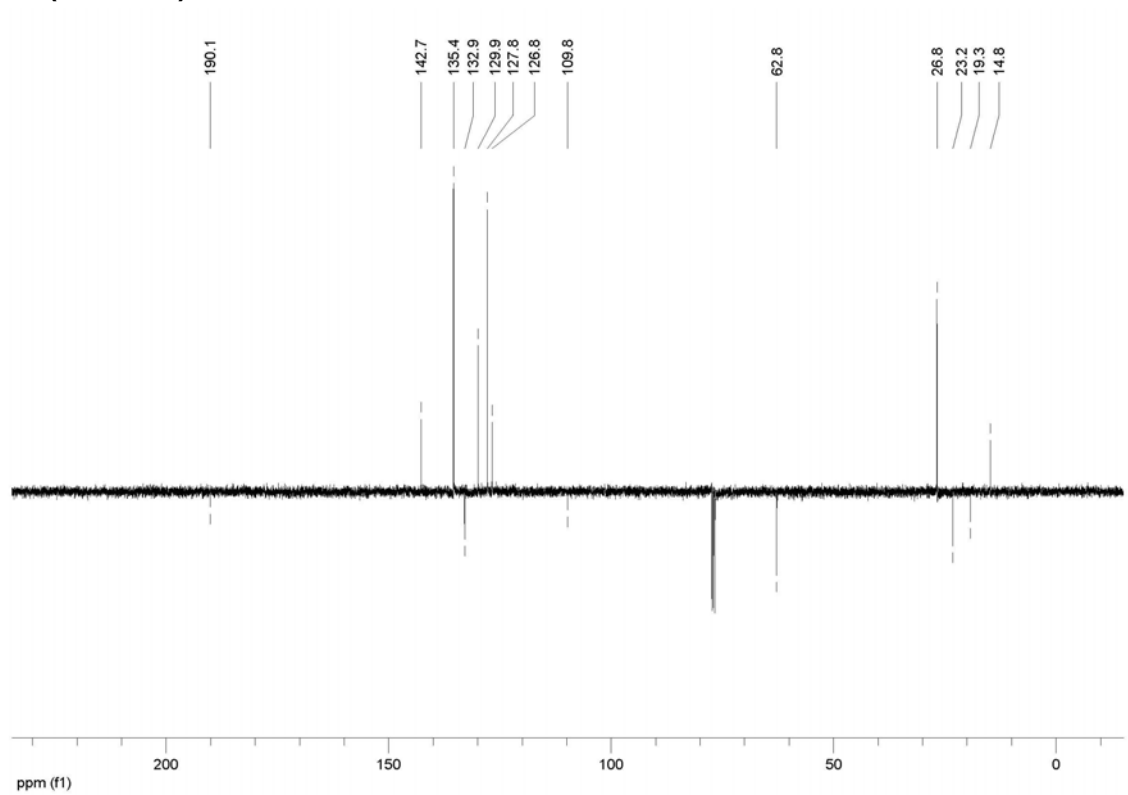
**18 ( $^{13}\text{C}$  NMR)**



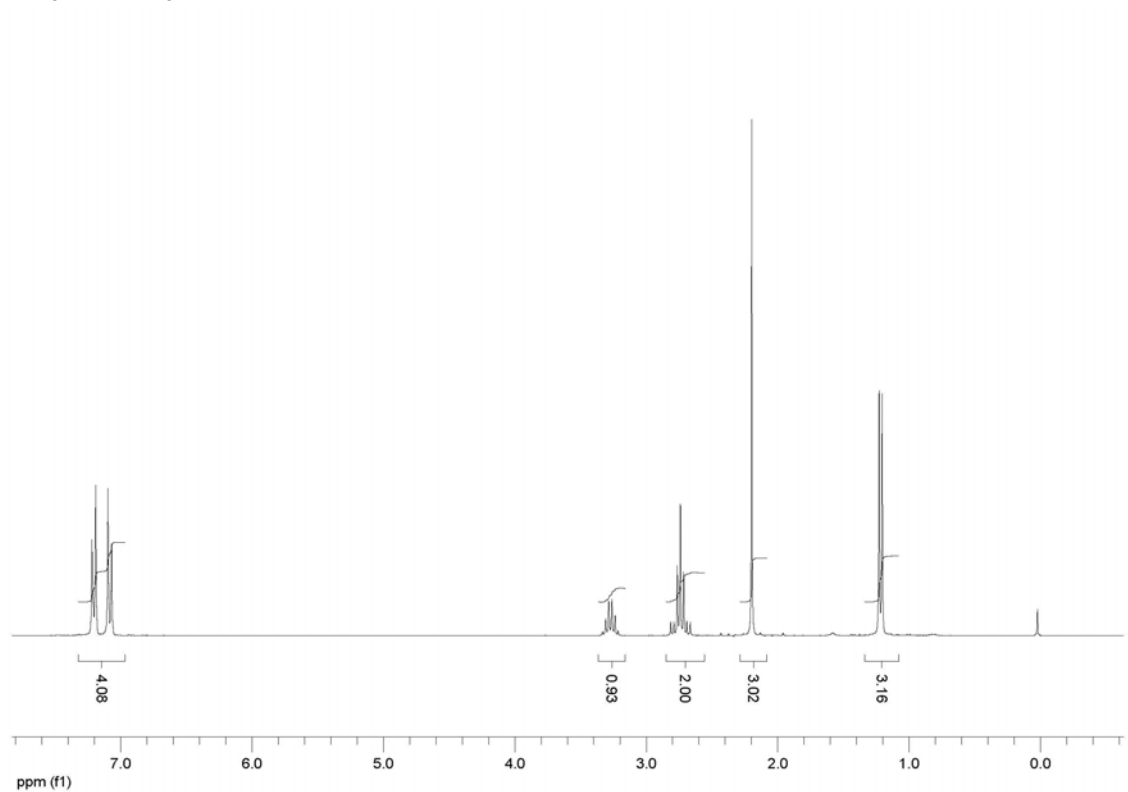
# 19 (<sup>1</sup>H NMR)



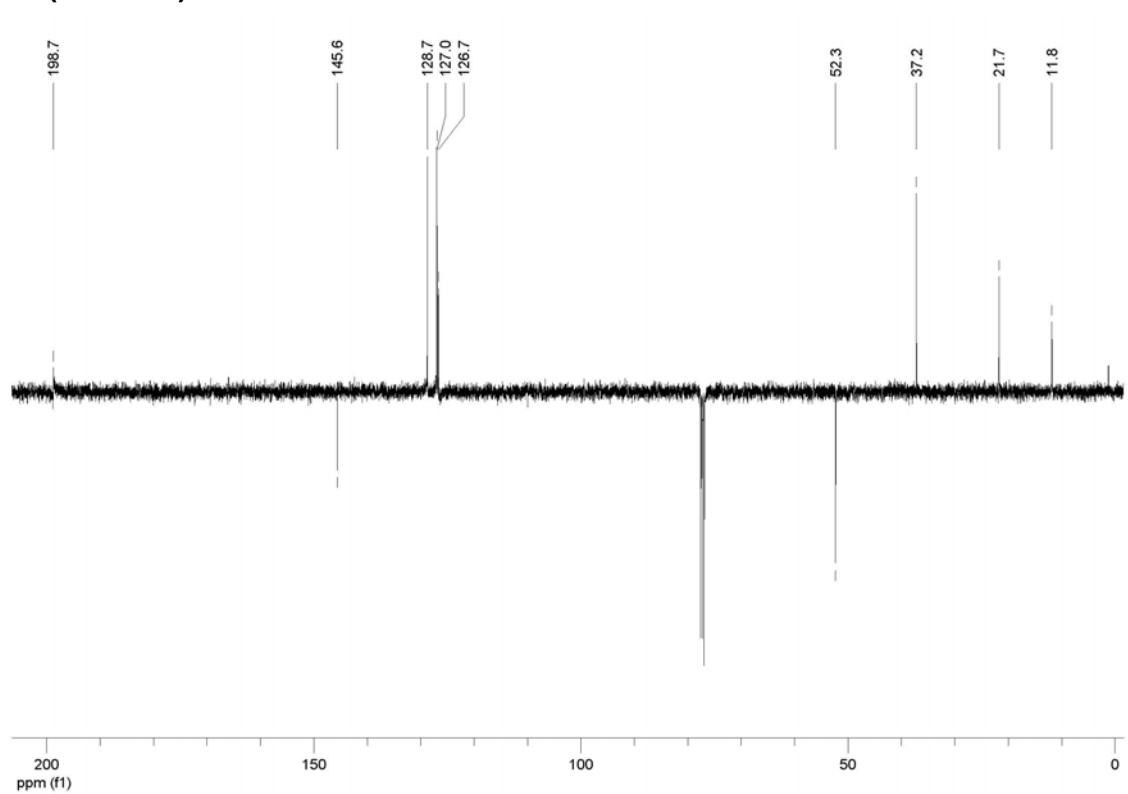
# 19 (<sup>13</sup>C NMR)



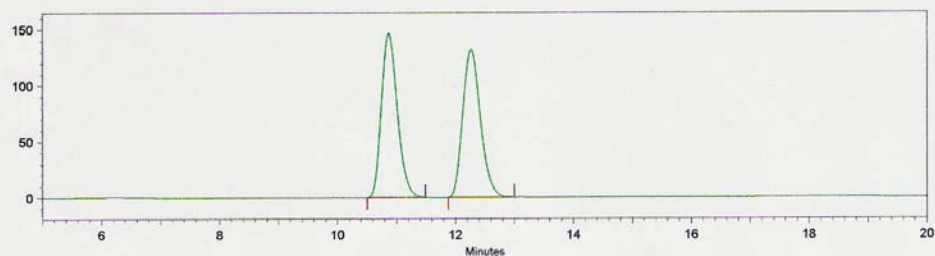
## 20 ( $^1\text{H}$ NMR)



## 20 ( $^{13}\text{C}$ NMR)



## 20 (HPLC)

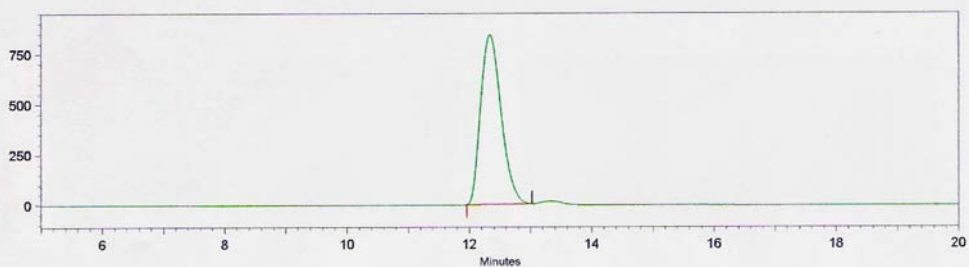
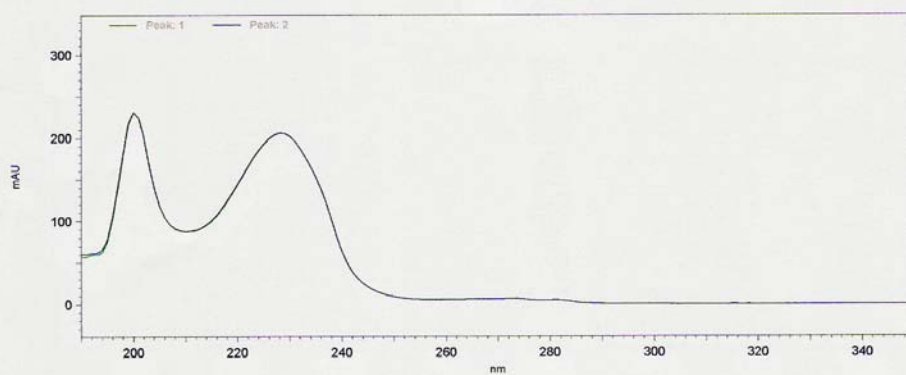


1: 235 nm, 8 nm

Pk #	Name	Retention Time	Area	Area Percent
1		10.869	2745141	50.00
2		12.267	2745481	50.00

Totals			5490622	100.00
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Peak: 1



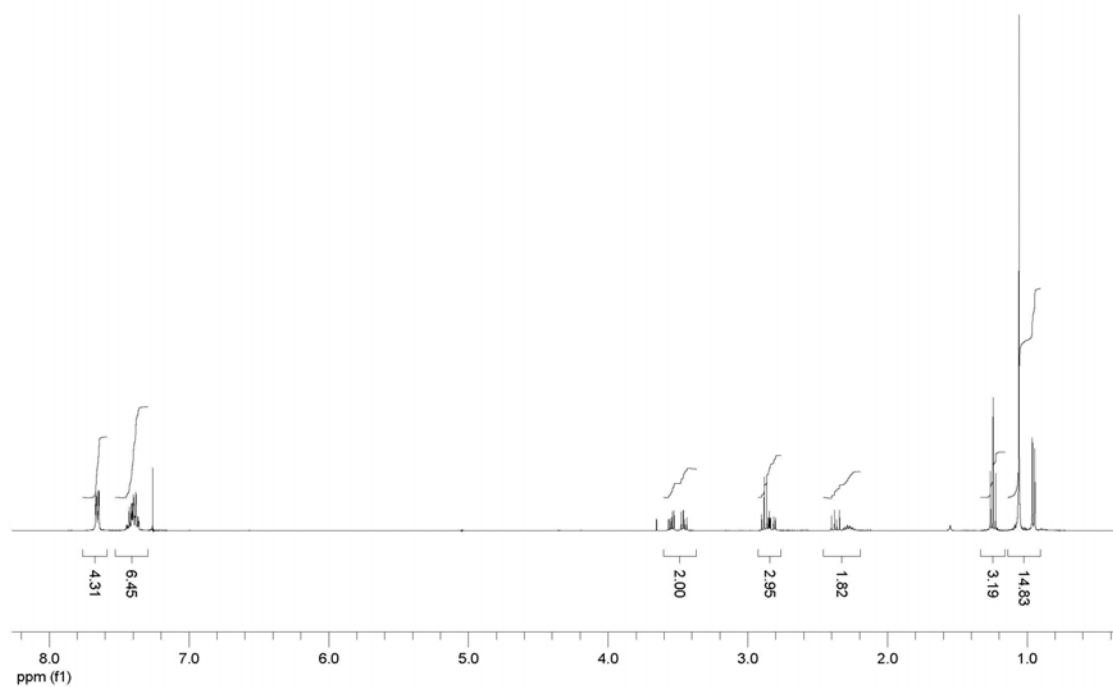
1: 235 nm, 8 nm

Pk #	Name	Retention Time	Area	Area Percent
1	1	12.341	19664662	100.00
2				

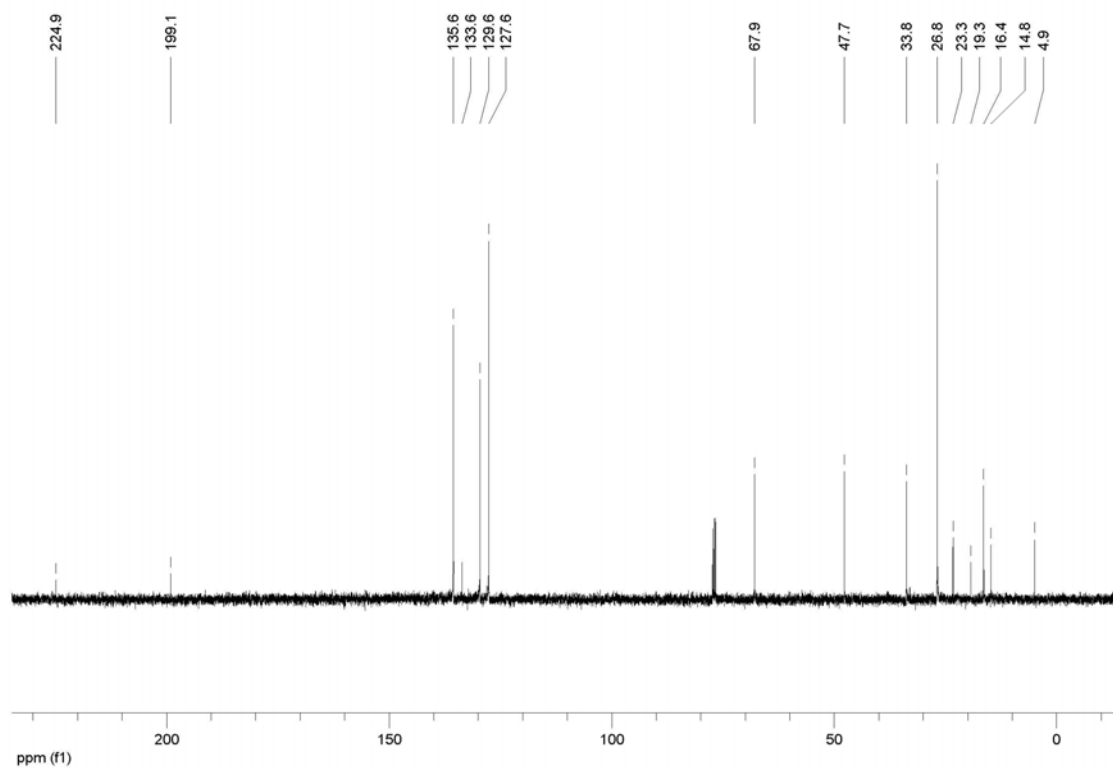
Totals			19664662	100.00
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Peak: 2

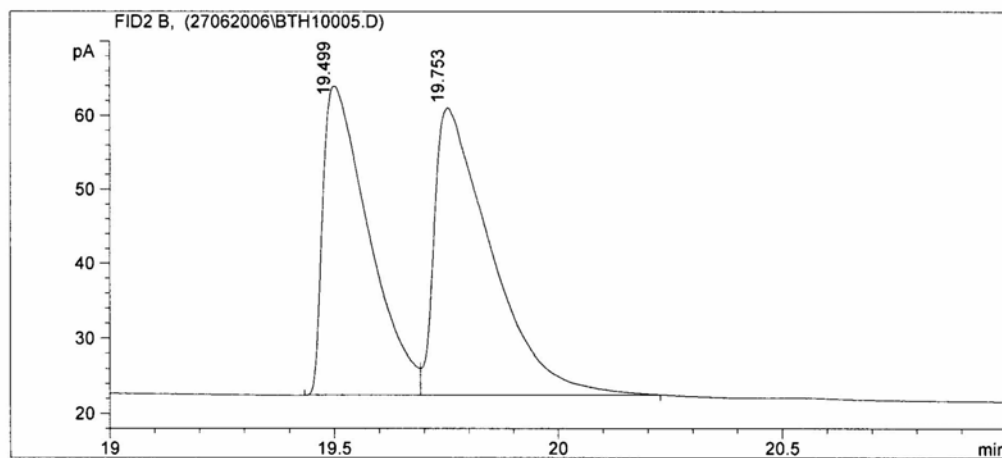
# 21 (<sup>1</sup>H NMR)



# 21 (<sup>13</sup>C NMR)

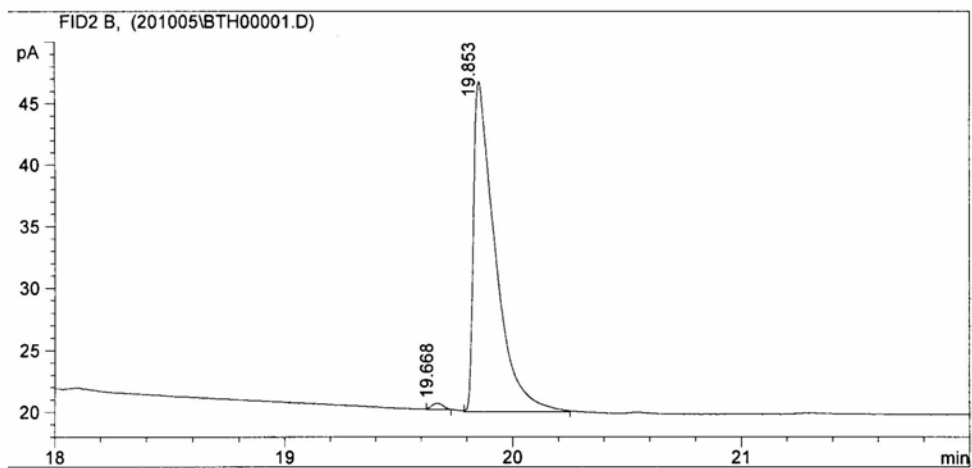


## 21 (GC Data for Lactone Derivative)



Signal 1: FID2 B,

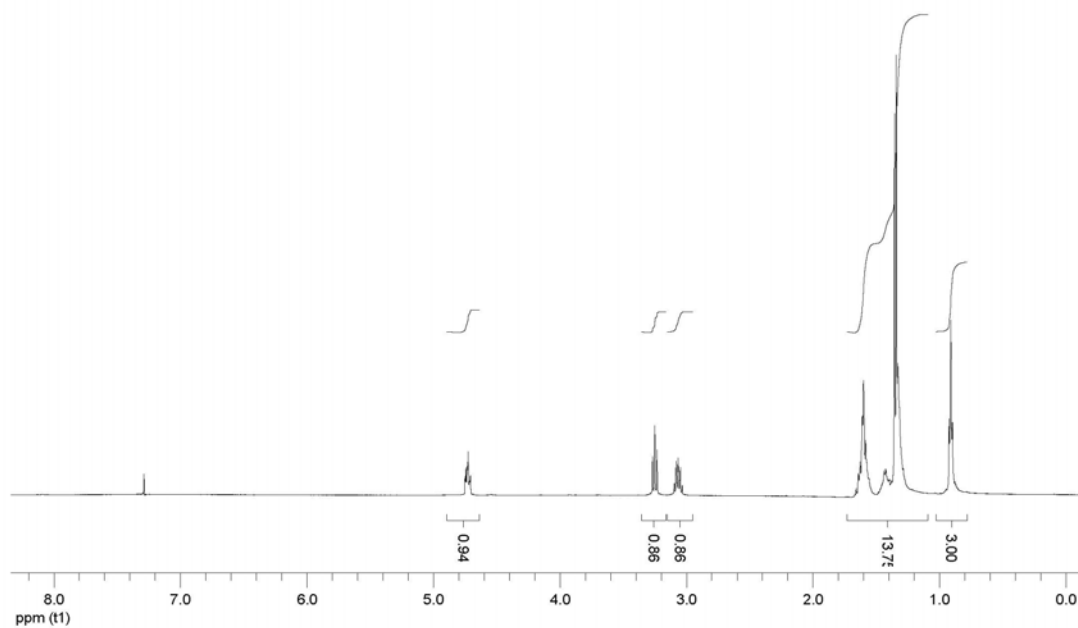
Peak #	RT [min]	Type	Name	Width [min]	Area	Area %	Response	Amount
1	19.499	MM		0.117	292.457	46.249	0.000	0.000
2	19.753	MM		0.147	339.903	53.751	0.000	0.000



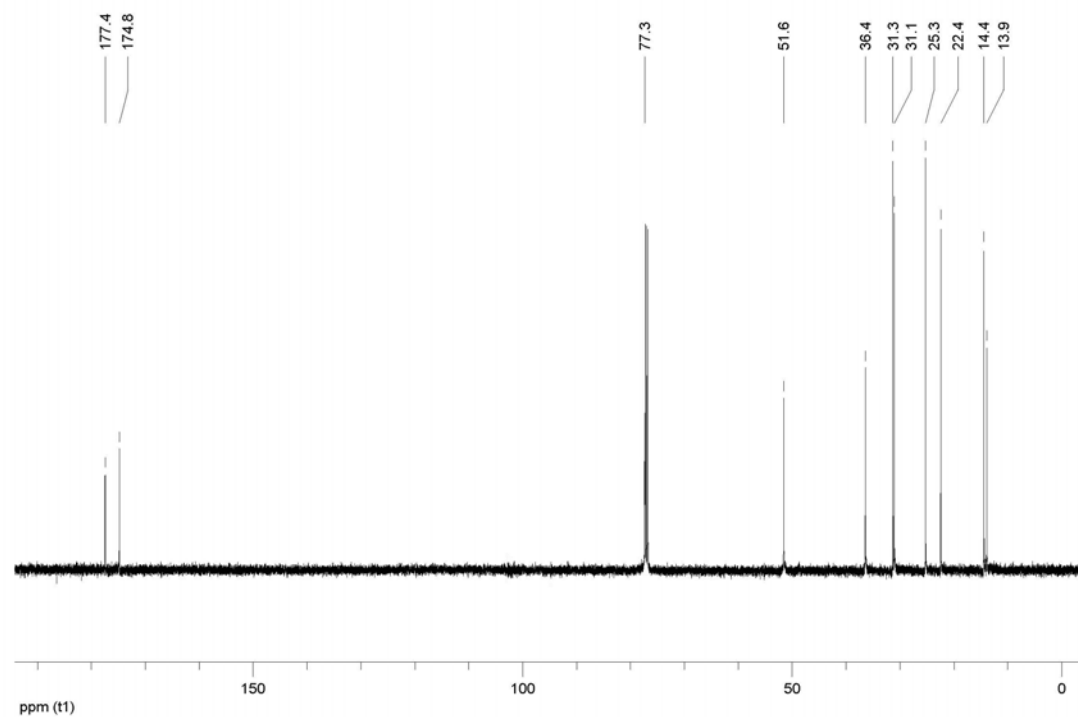
1: FID2 B,

RT [min]	Type	Name	Width [min]	Area	Area %	Response	Amount
19.668	MM		0.057	1.734	0.972	0.000	0.000
19.853	MM		0.110	176.570	99.028	0.000	0.000

## 22 ( $^1\text{H}$ NMR)

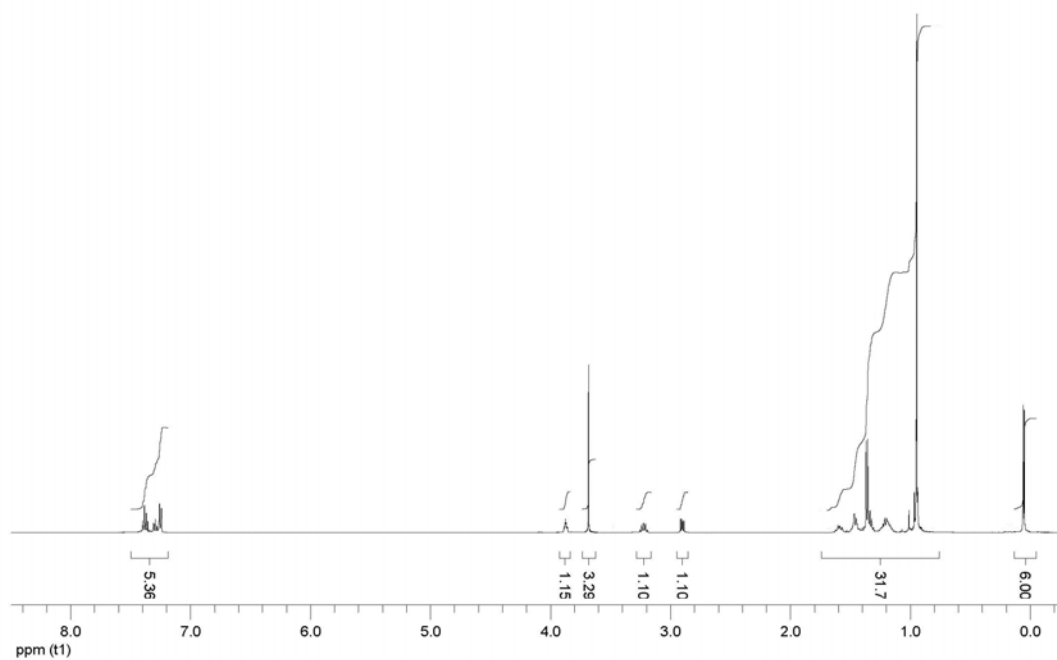


## 22 ( $^{13}\text{C}$ NMR)

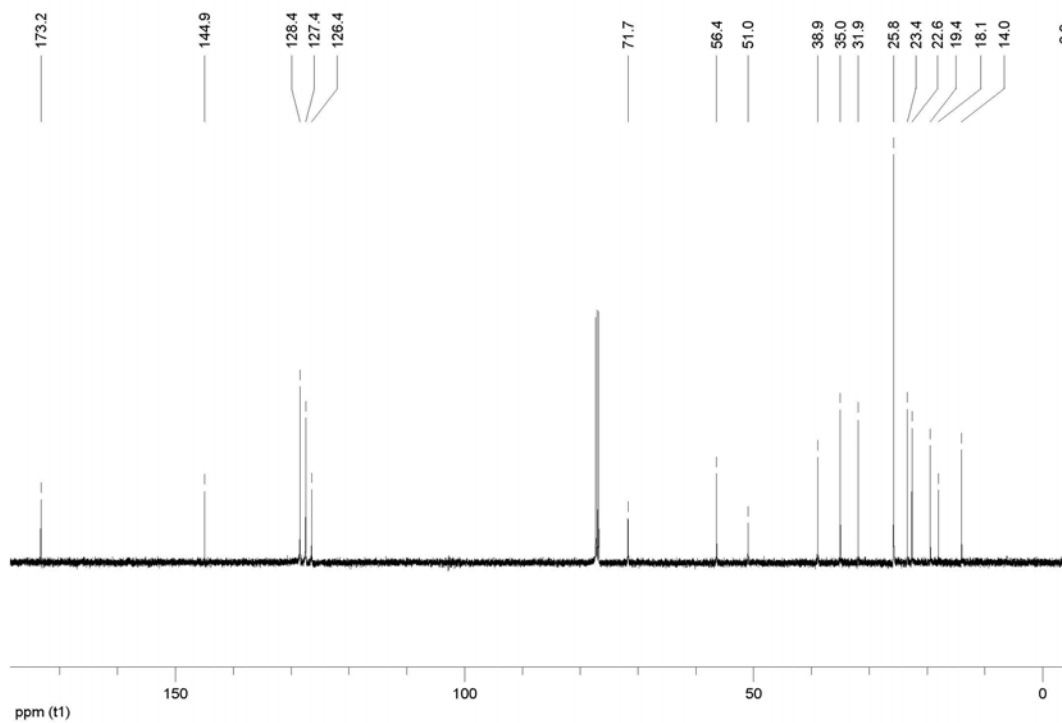




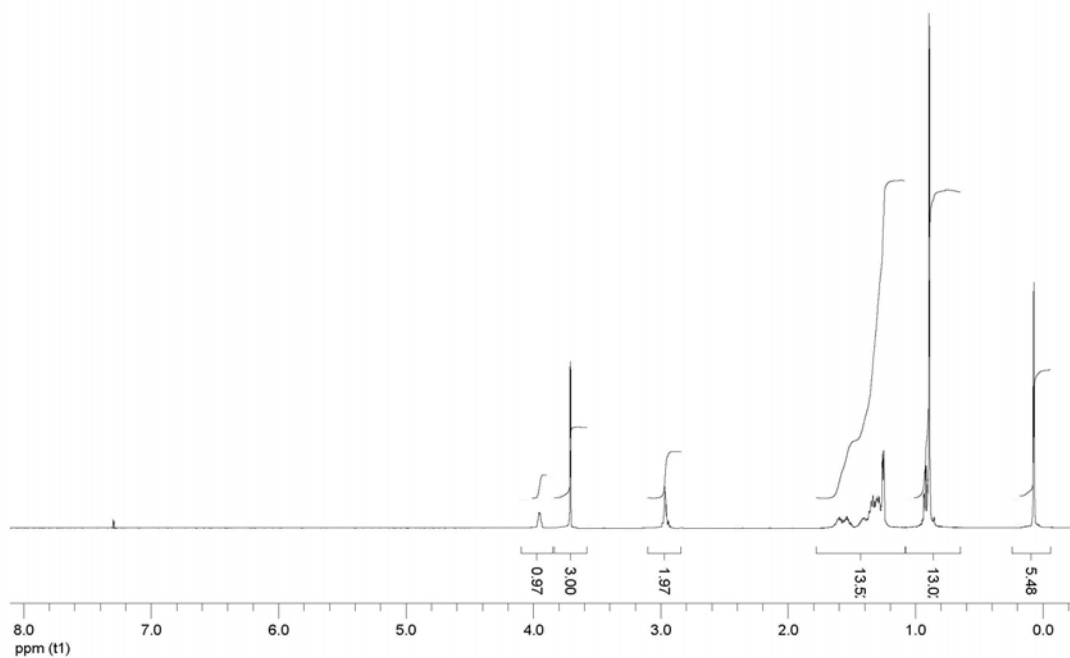
# 23 (<sup>1</sup>H NMR)



# 23 (<sup>13</sup>C NMR)



# 24 (<sup>1</sup>H NMR)



# 24 (<sup>13</sup>C NMR)

